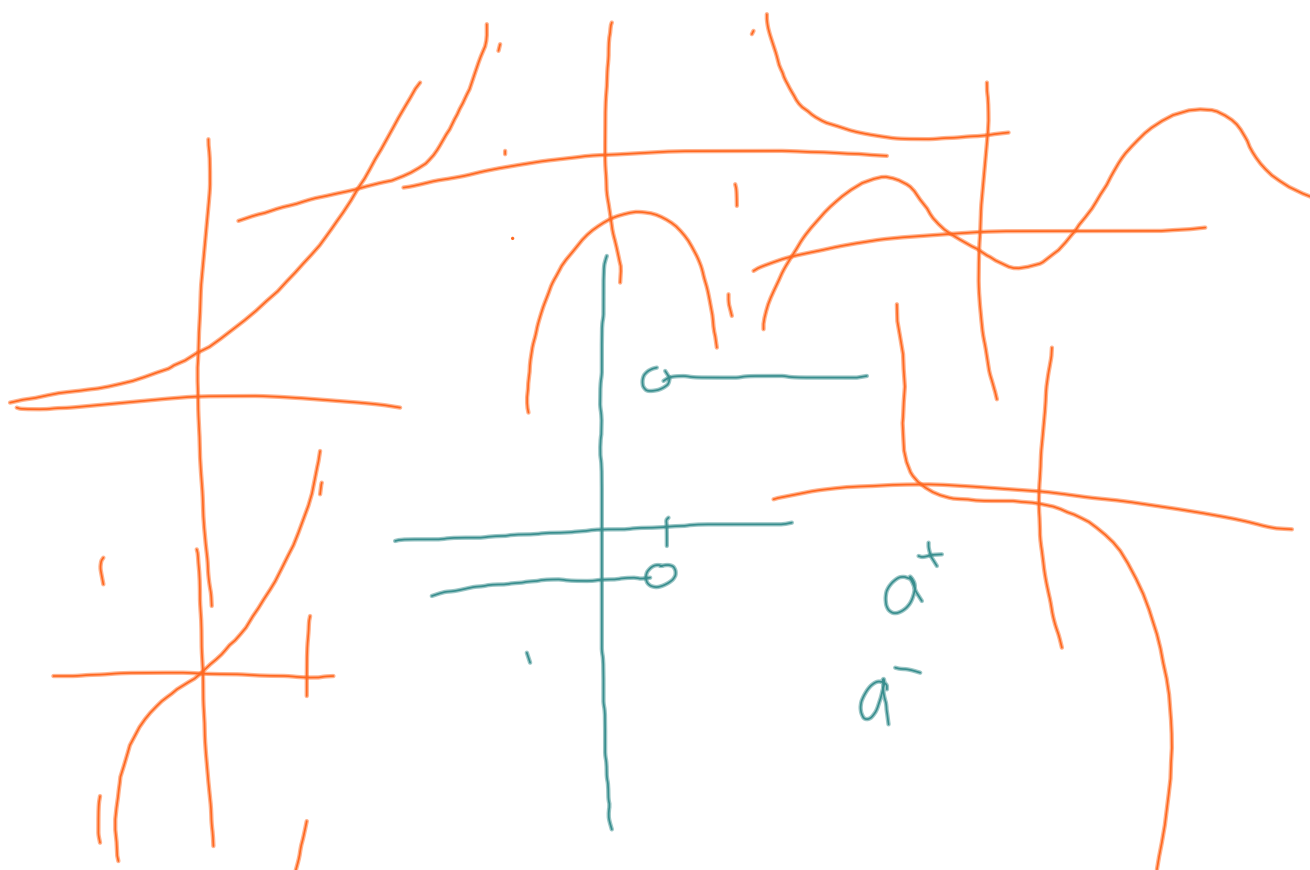


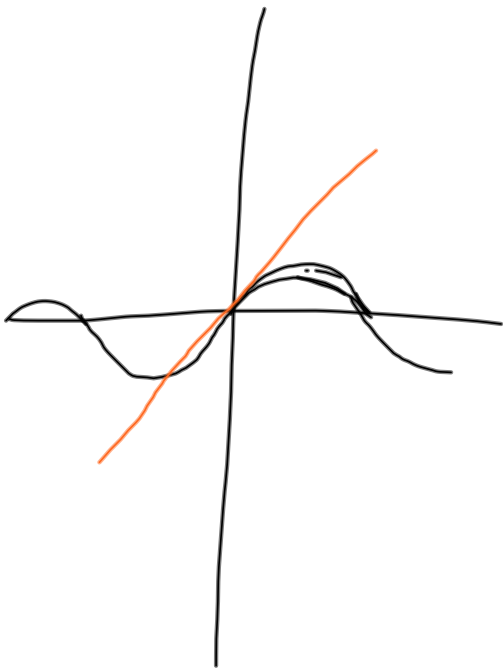
Two Sided
Exists
ONLY
When
both
1-sided lim
are "same"

$$\lim_{x \rightarrow 2} = 3 \quad 3$$

$\longrightarrow 2 \longleftarrow$

$$\lim_{x \rightarrow 2} \text{ (scribble) } = 3$$





$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

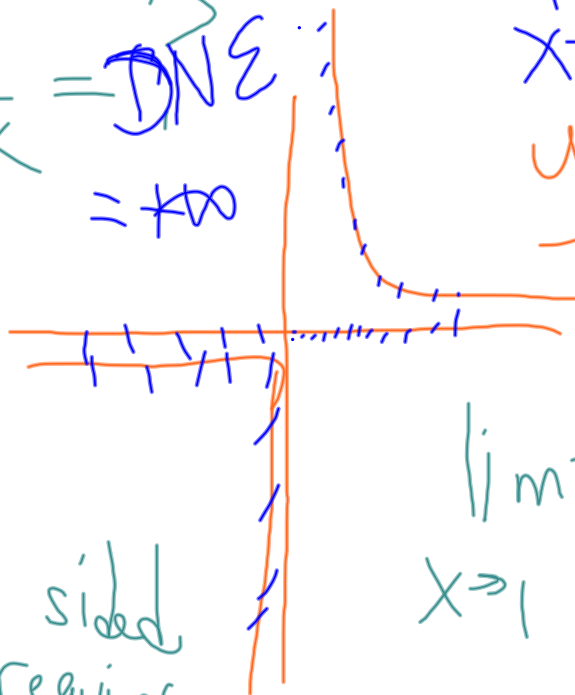
$$\lim_{x \rightarrow 2\pi} \frac{\sin x}{\textcircled{x}} = 0$$

$$\lim_{x \rightarrow 0^+} \frac{1}{x} = \text{DNE}$$

$$= +\infty$$

$$\lim_{x \rightarrow 0^-} \frac{1}{x} = -\infty$$

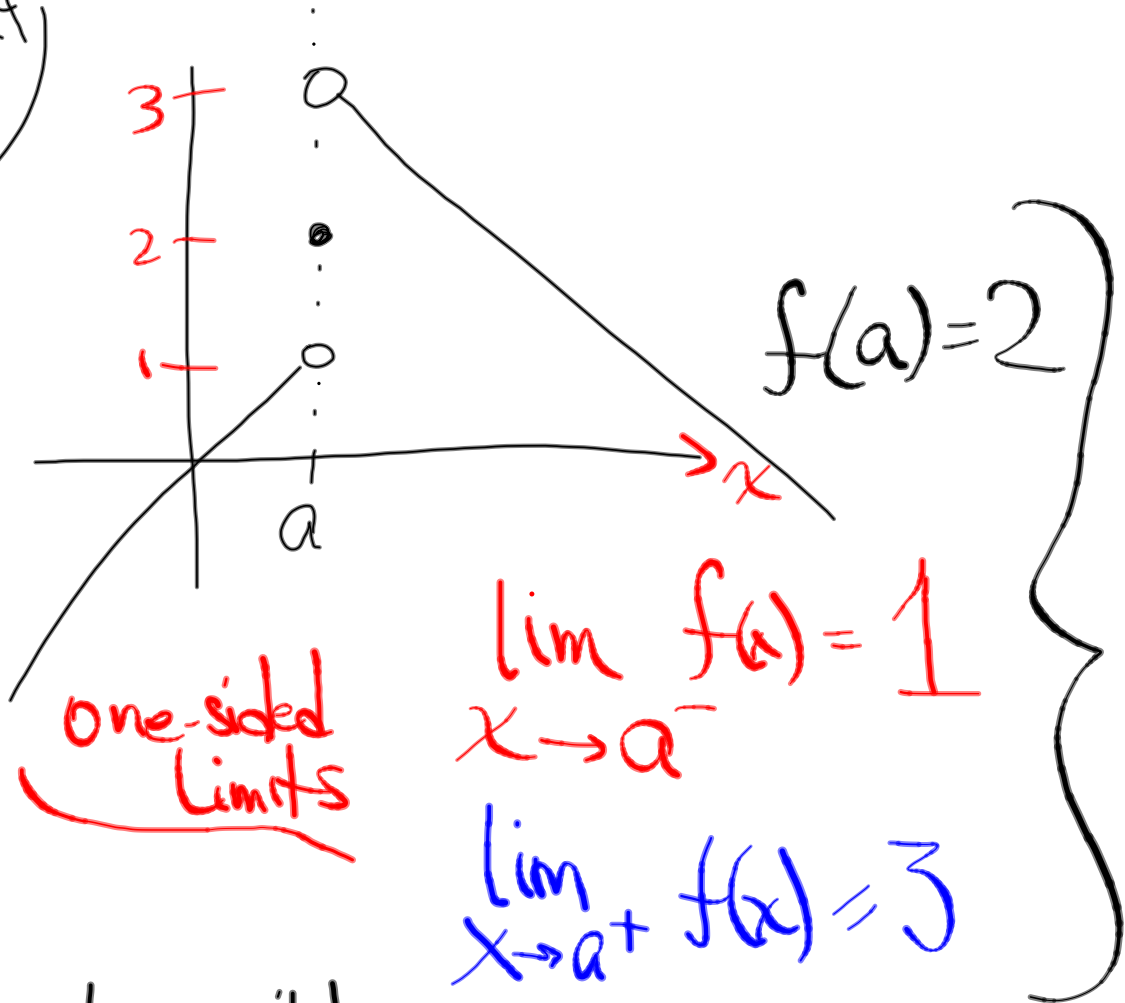
$y = \frac{1}{x}$



$$\lim_{x \rightarrow 1} \frac{1}{x} = 1$$

2 sided
requires
both 1-sided same

Ex 4
2-1



two-sided
limit:

$$\lim_{x \rightarrow a} f(x) = \text{DNE}$$

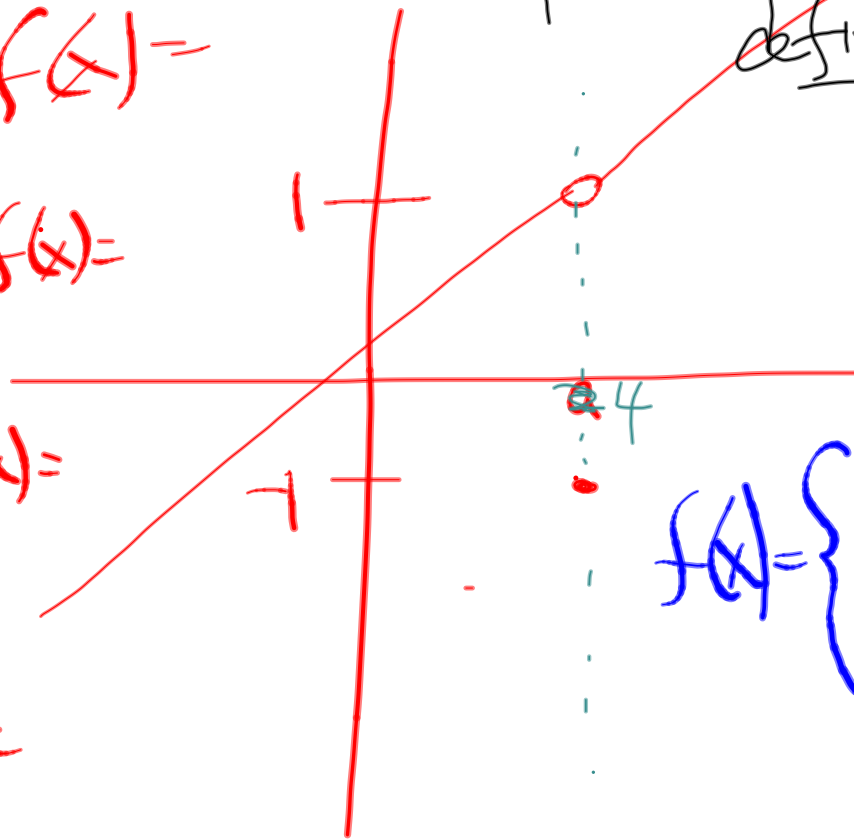
piecewise-
defined

$$\lim_{x \rightarrow a^-} f(x) =$$

$$\lim_{x \rightarrow a^+} f(x) =$$

$$\lim_{x \rightarrow a} f(x) =$$

$$f(a) =$$



$$f(x) = \begin{cases} \frac{x^2}{ax}, & x \neq a \\ -1, & x = a \end{cases}$$

